

controllers of selected ones of said tools to cause said respective tool controller to control said selected tool to automatically perform respective tooling operations on a selected unit of work conveyed to said selected tool.--

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--30. An automatic production system in accordance with Claim 29 wherein said remote controller comprises a master controller located remotely from said tools and said conveying means and wherein said master controller simultaneously controls a plurality of pallets holding a plurality of units of work.--

--31. An automatic production system in accordance with Claim 30 wherein said master controller simultaneously controls said plurality of tools to perform respective tooling operations on said plurality of units of work conveyed thereto.--

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--32. A machine system for operating on a plurality of different workpieces requiring different forms of machining operations performed by a plurality of machine tools, each machine tool being located at a respective machine work station and each being capable of performing different machining operations, said machine system comprising:

(a) means for conveying workpieces along predetermined routes to preselected of said machine work stations;

(b) programmable control means for controlling the conveyor means to select the predetermined route and specific machine work stations along the selected route to which each of said workpieces is conveyed, said predetermined routes and said preselected set of machine work stations being selectively variable for selected of said workpieces; and

(c) means for selectively transferring said workpieces to only said specific machine work stations so that each of said select workpieces follows a predetermined route to have a predetermined combination of machining

sequences performed thereon under the control of said programmable control means.--

--33. A system in accordance with Claim 32 wherein:

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- (a) said means for conveying workpieces comprises a plurality of controllable work pallets;
 - (b) said programmable control means comprises a master controller located remote from said conveying means; and
 - (c) wherein said master controller simultaneously controls a plurality of said pallets to select the routes and machine work stations to which said plurality of pallets are conveyed.--

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--34. A machining system for producing articles of manufacture from a plurality of workpieces of different shape, said system comprising:

- (a) a plurality of machine tools capable of performing different machining operations on different units of work, each of said machine tools including a local controller having a preselected address;
- (b) conveyor means operable for holding a plurality of workpieces, and for conveying each workpiece to only selected of said machine tools;
- (c) transport means for transporting workpieces between said conveyor means and only said selected machine tools to permit select machining sequences to be performed on each workpiece; and
- (d) programmable control means for selectively controlling the operations of said conveyor means and said transport means for each workpiece and for selectively addressing said selected machine tools for controlling the machining operations of said selected machine tools.--

--35. A system for machining a plurality of different workpieces requiring different machining operations, said system comprising:

(a) a plurality of machining means for performing variable machining operations;

(b) means for conveying each workpiece under the control of a programmable control means along a select route of travel defined by preselected stops at only selected of said machining means;

(c) programmable control means for selecting the route of travel and particular machining means and operations for a particular workpiece, and for controlling the conveying means so that said particular workpiece follows said selected route and stops only at said selected machining means to have particular machining operations performed thereon; and

(d) means for selectively transferring a workpiece from said conveyor means to said selected machining means.--

--36. An automatic production system comprising:

(a) a plurality of machine tools,

(b) conveying means for conveying units of work to only selected of the machine tools for performing programmed operations on work carried to said selected tools by said conveying means,

(c) control means for selectively addressing and controlling the operations of said plurality of machine tools in performing different operations on selected units of work conveyed to said tools,

(d) automatic inspection means for inspecting work operated on by selected of said tools, and

(e) means for operating said conveying means to dispose selected units of work in operative relation with respect to said automatic inspection means, and

(f) wherein said control means also controls the operation of said automatic inspection means in a manner such that, when a unit of work is operatively aligned with said automatic inspection means, said automatic

inspection means will perform a select inspection operation with respect to said unit of work.

--37. An automatic production system comprising:

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- (a) a plurality of addressable program controllable machine tools for performing different programmed operations on different units of work,
 - (b) automatic conveying means for conveying different work units only to selected of said tools,
 - (c) locating means at each tool for operatively locating work conveyed to the tool to permit the tool to perform on the work,
 - (d) automatic programmable inspection means located adjacent said conveying means for inspecting work operated on by selected of said tools,
 - (e) control means operable to generate and provide selected, addressed command control signals for selectively controlling the operation of said tools and for controlling the operation of said automatic inspection means to perform different inspection functions with respect to selected units of work, and
 - (f) said automatic inspection means including means for (i) identifying work conveyed by said conveying means for inspection and (ii) generating select control signals for controlling the inspection means to inspect selected work unit presented thereto for inspection.--

--38. An automatic production system in accordance with Claim 37 wherein said automatic inspection means comprises a plurality of separately operable automatic inspection tools.--

--39. An automatic production system comprising:

- (a) a plurality of addressable program-controllable production tool means for performing different programmed operations with respect to different units of work,

(b) automatic conveying means for conveying selected work units to stop only at selected of said tool means to permit the selected tool means to perform select operations with respect to the work units,

(c) work locating and securing means at each of said tool means for prepositioning and holding work conveyed to and stopped at each said tool means,

(d) control means for controlling the programmed operations of said tool means,

(e) said control means including (i) memory means having a plurality of command control messages recorded therein, (ii) means for controlling the reproduction of selected of said messages and (iii) for selectively addressing and communicating said reproduced messages to control the operations of said addressed tool means,

(f) means at each tool means for (i) identifying work units conveyed by said automatic conveying means to the vicinity of the tool means and (ii) generating identifying signals, and

(g) means for employing said identifying signals to operate said reproduction control means in a manner to effect the reproduction of selected messages from said memory means and the application of said messages to control the tool means to perform selected programmed operations on the work located at said tool means, and

(h) wherein said control means is also operable for controlling the operation of said work securing means to effect the release of work secured thereby after the tool means has completed its controlled operation on the work to permit the work to be conveyed by said conveying means to another of said selected tool means.--

--40. An automatic production system comprising in combination:

(a) a plurality of production tools arranged to form a production line in a work area,

(b) conveying means for work including a plurality of separate work carriers and means for power-driving said carriers past said plurality of production tools,

(c) means for controlling movement of selected of said carriers to stop only at selected of said production tools,

(d) means for positioning work conveyed to and stopped at each tool by its carrier to dispose said work in operative alignment with the tool,

(e) means at each tool for securing work conveyed to and aligned at the tool by a carrier, and

(f) control means for for selectively addressing the plurality of tools and controlling the operation of each addressed tool on work operatively aligned and secured at the tool to permit the tool to execute a programmed operation on the work, and

(g) said control means being operable to effect the release of work secured at each tool after the operation of the tool is completed to permit the work to be carried to the next selected production tool along said production line.--

--41. An automatic production system in accordance with Claim 40 wherein:

(a) said conveying means comprises a track supported above said tools,

(b) said plurality of carriers being supported for movement along said track, and

(c) said carrier movement control means includes means for propelling said carriers along said track parallel to said production line to carry the work to selected of said tools.--

~~--42. An automatic production system in accordance with Claim 41 wherein the track is a monorail.~~

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~~--43. An automatic production system in accordance with Claim 40 wherein:~~

~~(a) said conveying means comprises an overhead supported bi-rail track with at least one bridge crane supported for movement along said bi-rail track and at least one work carrier suspended from the bridge across each crane, and~~

~~(b) said power-driving means is operable to move (i) the bridge of each crane along said bi-rail track and (ii) each carrier back and forth along the crane bridge.--~~

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~~--44. An automatic production system in accordance with Claim 40 including means for controllably moving units of work presented to the tools by said carriers with respect to the tools to bring the work into operative alignment with the tools.--~~

~~--45. An automatic production system for performing different tool operations, such as cutting and shaping operations on different units of work, and wherein the dimensions and shapes of the workpieces vary during the tool operations thereon and wherein quality control is required to properly process work, comprising:~~

~~(a) a plurality of selectively addressable, program-controllable machine tool means for performing the different tool operations on the different units of work,~~

~~(b) automatic conveying means for operatively disposing selected of the different work units at selected machine tools,~~

~~(c) means for automatically addressing and controlling selected machine tools to operate on the work units conveyed thereto,~~

(d) automatic inspection means located proximate said conveying means for inspecting work after it has been operated on by selected of said tools to determine if the tools have properly performed their automatic operations on the work inspected,

(e) means for effecting predetermined relative alignment between said work and said automatic inspection means,

(f) control means for controlling the operation of said automatic inspection means to cause said inspection means to perform different programmed inspection operations on different units of work,

(g) means for identifying work operatively aligned for inspection by said automatic inspection means and generating code signals identifying said work, and

(h) means for applying said code signals to control the operation of said control means to effect selected inspection operations on different units of work operatively aligned with said inspection means.--

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--46. An automatic production system in accordance with Claim 45 wherein said automatic inspection means comprises a plurality of automatic inspection machines disposed at different locations in said production system.--

--47. An automatic production system in accordance with Claim 46 wherein at least one of said automatic inspection machines is multi-axis in its operation.--

--48. An automatic production system comprising in combination:

(a) conveying means for supporting and carrying a plurality of pallets, each pallet containing at least one unit of work and being carried along a path to define a production line,

(b) a plurality of production tools disposed adjacent the conveying means, with each tool being operable to perform programmed operations on work presented thereto,

(c) at least one of said tools including an automatic inspection device for inspecting work fed thereto and determining the results of the operations of at least some of the others of said tools on work carried by said pallets,

(d) means for aligning palletized work with selected of said tools to operatively locate the work with respect to said selected tools, and

(e) means for generating selectively addressable command control messages and for selectively applying said messages to selected of said tools to predeterminedly control the operation of said selected tools and said automatic inspection device when respective units of work are operatively located with respect thereto to effect preprogrammed operations by said selected tools on said work units and the automatic inspection of such work units after such operations are performed thereon.--

--49. An automatic production system comprising in combination:

(a) conveying means for supporting and carrying a plurality of pallets with each pallet holding at least one unit of work and being carried along a path to define a production line,

(b) a plurality of production tools disposed adjacent the conveying means with each tool being operable to perform programmed operations on work presented thereto,

(c) a plurality of pallet transfer and support means disposed adjacent said first conveying means, with each transport and support means containing (i) means for engaging a pallet conveyed thereto by the conveying means, and (ii) means for fixedly holding said pallets at said production tools to provide the work held thereby in fixed operative relation with respect to said tools,

(d) means for selectively operating said transfer and support means when a selected pallet is presented thereto by the conveying means to selectively transfer said selected pallet into operative relation with respect to a selected tool to which it is conveyed by said conveyor means,

(e) means for operating each pallet engaging means at a respective tool to fixedly hold each pallet presented thereto, and

(f) means for generating selectively addressable command control messages and applying said control messages to control the operation of selectively addressed tools when selected work is operatively located at the tools by the pallets to cause the tools to perform preprogrammed operations on the selected units of work.--

--50. An automatic production system comprising in combination:

(a) conveying means for supporting and carrying a plurality of pallets with each pallet containing at least one unit of work and travelling a path defining a production line,

(b) a plurality of production tool means disposed adjacent said conveying means, for performing programmed operations on work presented thereto,

(c) addressable storage means located at each tool means for storing respective command control signals and including means for selectively reproducing control signals therefrom for controlling the tool means,

(d) a plurality of transfer means disposed adjacent the conveying means for transferring pallets therefrom to respective of said tool means, and means at each tool for operatively locating work with respect to the tool means,

(e) means for selectively operating said transfer means when a selected pallet containing work to be operated on by a selected tool means adjacent said transfer means is conveyed to the transfer means to cause said transfer means to transfer the selected pallet to the selected tool means,

(f) control means for generating selectively addressable command control messages and means for selectively communicating respective of said messages to selected of said signal storage means, and means for recording the communicated messages in said selected signal storage means for use when reproduced thereafter in controlling respective of the tool means, and

(g) means at each transfer means for (i) identifying pallets on the conveying means, (ii) activating the transfer means when selected pallets are identified to transfer said selected pallets to selected of said production tool means, and (iii) effecting control of the signal storage means of the selected tool means to reproduce selected messages stored thereby and to apply said selected messages to control the selected tool means to perform programmed operations on the work located thereat.--

--51. An automatic production system comprising in combination:

(a) first conveying means for supporting and carrying a plurality of pallets, each containing at least one unit of work, in a given direction defining a production line,

(b) a plurality of addressable production tool means disposed adjacent said first conveying means for performing programmed operations on work presented thereto,

(c) a plurality of pallet transfer means disposed adjacent said conveying means for engaging pallets on said first conveying means and for transferring said pallets to respective of said tools,

(d) control means for generating command control messages, and

(e) means for selectively addressing said pallet transfer means and said tools to selectively apply said command control messages to control the operations of selected of said pallet transfer means and said tools in a manner to effect the transfer of selected work-holding pallets to selected of said tools and to predeterminately control the operation of said selected tools on work held by

selected of said pallets and to further effect the transfer of said pallets and work back to said conveying means after said operations have been performed on the work held by said pallets by said tools.--

--52. An automatic production system comprising in combination:

(a) first conveying means for supporting and carrying a plurality of pallets, each pallet holding at least one unit of work, along a given path defining a production line,

(b) a plurality of production tool means disposed adjacent said first conveying means for performing programmed operations on work presented thereto,

(c) a plurality of pallet transfer means disposed adjacent said first conveying means for selectively transferring pallets to said tool means,

(d) means aligned with each tool means for engaging a pallet transferred to said tool means by said transfer means,

(e) support means for fixedly holding a pallet in a manner to provide the work held by said pallet in fixed operative relation with respect to the tool means, and

(f) control means for generating command control signals and selectively applying said control signals to control the operations of only selected of said pallet transfer means and of said support means to effect the selective transfer of only selected work-holding pallets to only selected of said tool means and the fixed retention of said pallets at the tool means to which they are transferred to permit said tool means to perform programmed operations on the work presented thereto by said pallets.--

--53. An automatic production system in accordance with Claim 52 wherein said control means is also operable to selectively address and control the programmed operation of each selected tool means after a selected work-holding pallet is transferred

from said first conveying means to the support means at the tool means and is fixedly held in an operative position.--

--54. An automatic production system in accordance with Claim 53 wherein said control means is also operable to selectively address and control the operation of selected of said means for fixedly holding pallets in a manner to permit same to hold a selected pallet and fixedly position work held by the pallet with respect to the tool means and to release the pallet to permit the pallet and work to be transferred from the tool support means back to said first conveying means.--

--55. An automatic production system in accordance with Claim 52 wherein said control means is also operable to selectively address and control said pallet transfer devices, after selectively controlling the operation of a tool means to perform on work held by a pallet, to transfer pallets from the pallet support means of the tool means to said first conveying means to permit said first conveying means to carry pallets to another selected tool means adjacent said production line.--

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--56. An automatic production system comprising in combination:

(a) a conveyor that supports and carries a plurality of pallets in a given direction along a select path defining a production line, each pallet holding at least one unit of work,

(b) a plurality of production tools disposed adjacent to said conveyor that perform different programmed operations on different units of work conveyed thereto on said pallets,

(c) a plurality of pallet transfer devices, each operable to transfer a pallet from said conveyor to dispose it and the work it holds adjacent to at least one selected production tool,

(d) a securing device at each tool that engages and holds a pallet at a predetermined location with respect to said tool to dispose the work held by the

pallet in a fixed position with respect to the tool, thereby enabling the tool to perform respective operations on said work, and

(e) a controller that generates and selectively addresses command control messages to control selected pallet transfer devices, securing devices, and production tools: (1) to transfer selected of said pallets to selected of said tools, and (2) to perform selected programmed operations on selected work supported by said selected pallets.--

--57. An automatic production system in accordance with Claim 56 wherein said controller is also operable to control the operations of a plurality of said tools to permit each of said selected tools to simultaneously operate on work presented thereto on said pallets.--

--58. An automatic production system in accordance with Claim 56 wherein said securing device comprises respective pallet clamping devices operable to engage and hold said pallets in a fixed position with respect to respective of said tools.--

--59. An automatic production system in accordance with Claim 58 wherein said controller is a master controller that further controls the operations of said securing devices to cause them to hold pallets and to fixedly position work held by said pallets with respect to an associated tool and to release the pallets to permit the pallets and work to be transferred from the associated securing device to said conveyor.--

--60. An automatic production system in accordance with Claim 56 wherein said controller is a remote controller that is operable to remotely control the operation of respective of said pallet transfer devices and its associated tool to predeterminately perform operations on work held by a pallet, and to transfer pallets between the securing device of each tool and said conveyor.--

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--61. An automatic production system comprising in combination:

(a) first conveying means for supporting and carrying a plurality of pallets, in a given direction defining a production line each pallet containing at least one unit of work,

(b) a plurality of production tools disposed adjacent said first conveying means, with each tool being operable to perform programmed operations on work presented thereto,

(c) said tools including a plurality of cutting tools operable to cut and remove material from work presented thereto,

(d) said tools also including at least one automatic inspection means for inspecting work fed thereto and detecting the results of the operation of said tools in removing material from said work,

(e) means for transferring palletized work from said first conveying means to selected of said tools, and

(f) control means for generating command control messages and selectively distributing and applying said messages to control the operation of said pallet transfer means, selected of said machine tools, and said automatic inspection device in a manner to effect the transfer of selected work to only said selected tools, to permit the tools to perform selected programmed operations on work transferred thereto, and to effect the automatic inspection of said work after it is operated on by at least one of said machine tools to automatically determine if the machine tool has properly performed a programmed operation on said work.--

--62. An automatic production system in accordance with Claim 61 including a feedback control system for controlling the operation of said automatic inspection device to permit the device to perform different inspection operations on different units of work.--

--63. An automatic production system comprising:

- (a) plurality of machine tools,
- (b) automatic conveying means for conveying units of work to only selected of said machine tools for performing programmed operations on work carried to said selected tools by said conveying means,
- (c) control means for controlling the operations of said machine tools when work is disposed at said tools by said conveying means to permit different programmed operations to be performed on different units of work, and
- (d) an automatic inspection means disposed proximate said automatic conveying means,
- (e) said automatic inspection means being programmable in its operation,
- (f) said control means being operable to control said conveying means to feed a selected unit of work to said automatic inspection means and to controllably program the operation of said inspection means when a unit of work is disposed thereat to permit said automatic inspection means to perform a selected programmed inspection operation on said work.--

--64. An automatic production system in accordance with Claim 63 including feedback control means for said automatic inspection means responsive to a signal generated by said control means for controlling the operation of said automatic inspection means to perform selected inspection operations on different units of work fed to said automatic inspection means.--

--65. An automatic production system in accordance with Claim 63 wherein said automatic inspection means is located at one of said tools which is operable to machine work, said automatic inspection means being operable to inspect work which is machined by the tool.--

--66. An automatic production system in accordance with Claim 65 wherein said machine performs a cutting cycle, and said automatic inspection means is operable to inspect work at the tool during the cutting cycle.--

--67. An automatic production system comprising in combination:

(a) first means including a plurality of self-propelled conveying means for conveying a plurality of units of work in sequence along a path,

(b) second means including a plurality of variably operable powered tools disposed at different locations adjacent said path,

(c) third means for generating selectively addressable command control signals in the form of separate machine control messages for use in controlling the operation of said tools,

(d) fourth means at each of said tools for receiving selectively addressed messages generated by said third means,

(e) fifth means for transmitting selectively addressed messages generated by said third means to said receiving means of selected of said tools,

(f) sixth means at each of said tools for applying the selectively received messages to control the operation of said tool, and

(g) seventh means for detecting the presence of work carried by said conveying means when said work is operatively aligned with respective of said tools and for initiating the generation and application of select control signals to control the operation of the tool at which the work is aligned,

(h) said programmed operation on said work being in accordance with the information defined by the selectively addressed messages received at the tool.--

--68. An apparatus in accordance with Claim 67 wherein each of said tools is operable to perform controlled operations on work supported by said conveying means while said conveying means is stopped at the tool.--

--69. An apparatus in accordance with Claim 67 wherein at least certain of said tools are numerically controllable tools and said selectively addressed control messages are operable to numerically control the operation of said tools to perform programmed operations on work supported by respective of said self-propelled conveying means.--

--70. An automatic production system comprising in combination:

(a) first means including self-propelled conveyors for conveying a plurality of units of work in sequence along a path,

(b) second means including a plurality of separately operable and selectively addressable powered tools disposed at different locations adjacent said given path,

(c) third means operable to generate selectively addressable command control signals in the form of separate machine control messages for use in controlling the operation of respective of said selectively addressable tools,

(d) fourth means having a specific address at each of said tools for selectively receiving only correspondingly addressed messages generated by said third means,

(e) fifth means for transmitting selectively addressed messages generated by said third means to respective of said receiving means of selected of said tools for controlling the operation of of said tools, and

(f) sixth means for detecting the presence of work on said conveying means when said work is operatively aligned with respective of said tools and for initiating the generation and application of selectively addressed control signals to control the operation of selected of the tools at which said work is aligned to cause said tools to perform a programmed operation on the work supported by the conveying means,

(g) ~~said programmed operation on said work being in accordance with the information defined by the selectively addressed messages received at said tool.--~~

--71. An automatic production system comprising in combination:

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- (a) first means including a power-operated conveying means for conveying a plurality of units of work along a path,
- (b) second means including a plurality of separately operable powered tools disposed at different locations adjacent said conveying means,
- (c) third means operative to generate selectively addressable command control signals in the form of separate messages for use in controlling the operation of selective of said tools,
- (d) fourth means at each of said tools for selectively receiving messages from said third means, said fourth means including a specific address,
- (e) fifth means for selectively transmitting specifically addressed messages generated by said third means to correspondingly specifically addressed fourth means of selected of said tools and means for applying the selectively received messages to control the operation of said selected tools, and
- (f) sixth means for detecting the presence of work conveyed by said conveying means when said work is operatively aligned with a respective tool and applying select command control signals received by said receiving means of said tool to cause the tool to perform a predetermined operation on the work aligned thereat in accordance with the tool control function defined by said select command control signals.--
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--72. An automatic production system in accordance with Claim 71 wherein each of said tools includes an automatic manipulator having a manipulation arm assembly and an operating head supported thereby containing a power-operated device, control means for said power-operated device which is controlled in its

operation by part of the selectively received messages applied to control the operation of said tool on work aligned thereat.--

--73. An automatic production system comprising in combination:

- (a) first means including a power-operated conveying means for conveying a plurality of units of work in sequence along a path,
- (b) second means including a plurality of separately operable powered tools disposed at different locations adjacent said conveying means,
- (c) third means including master control means operative to generate selectively addressed command control signals in the form of separate message for use in controlling the operation of selected of said tools, and
- (d) fourth means at each of said tools including a specific address for receiving correspondingly addressed messages from said control means and for applying same to selectively operate on work delivered by said conveying means to said selected tool.

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74. An automatic production system comprising in combination:

- (a) first means including a power-operated conveying means for conveying a plurality of units of work in sequence along a path,
- (b) second means including a plurality of separately addressable tools disposed at different locations adjacent said conveying means,
- (c) third means including control means operative to generate command control signals in the form of separate messages for use in selectively addressing and controlling the operation of selected of said tools, and
- (d) fourth means at each of said tools for receiving, recording and reproducing selectively addressed command control signals transmitted from said control means and for applying same to automatically operate on work delivered by said conveying means to said tool.--

--75. An automatic production system comprising in combination:

- (a) first means including power-operated conveying means for conveying a plurality of units of work along a path,
- (b) second means including a plurality of individually addressable and separately operable powered tools disposed at different locations adjacent said conveying means,
- (c) third means for generating selectively addressed command control signals in form of separate messages for communication to correspondingly addressed tools for use in controlling the operation of said tools,
- (d) fourth means associated with each of said tools and having an individual address identifying said tool for selectively receiving and recording correspondingly addressed messages communicated from said third means and for selectively reproducing said recorded control signals when work is positioned at said machine,
- (e) fifth means for selectively communicating addressed messages generated by said third means to said correspondingly addressed fourth means of selected of said tools and means for applying the received and reproduced messages to control the operation of said respective tools, and
- (f) sixth means for detecting the presence of and identifying work conveyed by said conveying means when said work is operatively aligned with a respective tool and for applying select command control signals reproduced from recorded messages to cause the tool to perform a predetermined operation on the work at the tool in accordance with the tool control function defined by said select command control signals.--

--76. An automatic production system comprising in combination:

- (a) conveying means for a plurality of work holding pallets each supporting at least one unit of work, said conveying means being operable to convey said pallets along a select path,

(b) a plurality of work stations located adjacent said path, each work station having a machine tool and power operated means for holding and locating a work pallet at the machine tool,

(c) each of said machine tools having a power operated tool, first motor means for effecting multi-axis movement of said tool, and respective control means for each of said motor means,

(d) remote control signal generating means for generating addressed tool control signals in the form of command control messages,

(e) each of said work stations having an addressable message signal receiving and recording means,

(f) means for operating said remote control signal generating means to cause it to generate and transmit respective of said addressed command control messages to correspondingly addressed work station receiving and recording means to effect receipt and recording of select messages at select work stations,

(g) means for identifying each of said work holding pallets when the pallet is conveyed by said conveying means to select work stations and for generating control signals, and

(h) means for applying said latter control signals to effect the predeterminate positioning of said work with respect to the tool of the select work station.--

--77. An automatic production system in accordance with Claim 76 wherein the work is predeterminately located on the pallets and the pallets are held and prepositioned at the work stations.--

--78. An automatic production system in according with Claim 76 wherein said pallets contain readable codes and said identifying means scans said codes to identify said pallets at said work stations.--